REMARKS

After reviewing the Office Action dated 27 October 2003, Applicants offer the following response. In this response, Applicants provide arguments rebutting the Examiner's rejections.

The Examiner rejected claims 1-3, 8-17, 20-23, and 27-32 under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,889,827 to Bottomley et al., herein referred to as Bottomley. Bottomley discloses a method and apparatus for estimating a composite channel of a wireless system using knowledge of the pulse shaping (Abstract). The composite channel estimate includes the response associated with the transmit filter, the transmission medium response, and the response associated with any receive filters (column 4, lines 21-24). The claimed invention relates to estimating the response of the pulse-shaping filter in the receiver based on known symbols, such as known training symbols. As discussed further below, there is nothing in Bottomely that teaches or suggests estimating the response of a pulse-shaping filter in a receiver.

Claim 1, *inter alia*, claims "a pulse-shape estimator coupled to the sampler, the pulse-shape estimator calculating an <u>estimated impulse response of the pulse-shaping filter</u> based on the sampled version of the received signal and on an expected plurality of training symbols" (emphasis added). In rejecting this claim, the Examiner asserts that Bottomley determines "the transmission medium response as well as the response associated with the receive filter." To support this assertion, the Examiner relies on column 4, lines 17-30. However, there is nothing in the cited section to teach or suggest determining a response associated with a receive filter. In fact, the cited section simply states, "traditional coherent baseband demodulation includes channel

estimation, which is applied to the received samples using detected or known symbol values. The result is an <u>estimate of the composite channel</u> ... The composite channel response includes the response associated with the transmit filter 202, the transmission medium response 204 <u>and</u> the response associated with any receive filters 206" (emphasis added). In other words, Bottomley teaches determining an estimate of a <u>composite</u> channel response, where the composite channel response <u>includes</u>, among other things, the response associated with a receive filter.

Contrary to the Examiner's assertions, there is nothing in Bottomley that teaches or suggests determining the response of a receive filter, much less using a pulse-shape estimator to determine the response of a receive filter based on expected symbols, as claimed in claim 1. Because Bottomley does not disclose "a pulse-shape estimator ... calculating an estimated impulse response of the pulse-shaping filter," Bottomley does not teach or suggest each and every limitation of claim 1, as required under §102. For at least this reason, Bottomley cannot anticipate claim 1.

Because Bottomley cannot anticipate claim 1, Bottomley cannot anticipate dependent claims 2-10. Applicants respectfully request reconsideration and allowance of claims 1-10.

Similarly, independent claims 20 and 28 both include the limitation "a pulse-shape estimator ... calculating an estimated impulse response of the pulse-shaping filter." Therefore, for substantially the same reasons provided above with respect to claim 1, claims 20 and 28 are also patentably distinct from the cited art. Because independent claims 20 and 28 are patentably distinct, dependent claims 21-27 and 29-

32, respectively, are also patentably distinct from the cited art. Applicants respectfully request reconsideration and allowance of claims 20-32.

Regarding independent method claim 11, which includes the limitation "estimating an impulse response of the pulse-shaping filter based on the filtered signal and on an expected signal," the Examiner again cites column 4, lines 17-30 as a basis for his rejection. However, as discussed above, Bottomley discloses a method of composite channel estimation. There is nothing in column 4 or in the rest of Bottomley that teaches or suggests estimating a receive filter, such as a pulse-shaping filter, based on an expected signal as claimed in claim 11. For at least this reason, Bottomley cannot anticipate claim 11.

Because Bottomley cannot anticipate independent claim 11, Bottomley cannot anticipate dependent claims 12-19. Applicants respectfully request reconsideration and allowance of claims 11-19.

Because, as argued above, each of the independent claims is patentably distinct from the cited art, the §103 rejections cited against dependent claims 18, 25, and 26 are rendered moot. As such, this response will not include any further discussion of these rejections.

In addition to the arguments presented above, Applicants submit that dependent claims 3, 9, 16-17, 22, and 32 are patentably distinct from Bottomley. Claim 3 and 22 each include the limitation of pre-storing the training symbols in the pulse-shape estimator. However, the receiver of Bottomley does not include a pulse-shape estimator. Because Bottomely does not have a pulse-shape estimator, Bottomely

cannot store training symbols, or anything else, in the pulse shape estimator. As such, Bottomley cannot anticipate dependent claims 3 and 22.

Claims 9 and 32 each include a compensation filter that calculates "coefficients for a digital compensation filter that minimizes the squared error between the estimated impulse response and a desired impulse response" (emphasis added). The Examiner cites column 2, lines 1-10 and asserts that Bottomley calculates and squares an error and uses this squared error to correct the receiver. However, the cited passage minimizes a squared error metric based on the "differences between what was received and what was expected to be received" (column 2, lines 5-6). Contrastingly, claims 9 and 32 claim minimizing a squared error metric based on the differences between an estimated impulse response of the pulse-shaping filter and a desired impulse response of the pulse-shaping filter. In other words, the minimized square error metric of the present invention has nothing to do with the comparison between received and expected signals, but instead relates to the comparison between actual and expected filter responses in the receiver. Because nothing in Bottomley teaches or suggests minimizing "the squared error between the estimated impulse response and a desired impulse response" of the pulse-shaping filter, as claimed in claims 9 and 32, Bottomley cannot anticipate claims 9 and 32.

Claim 16 claims "wherein the pulse-shaping filter is adjusted during the manufacturing process based on the estimated impulse response" (emphasis added). In rejecting claim 16, the Examiner asserts, "every pulse-shaping filter is adjusted during manufacturing process." However, with all due respect, the Examiner has ignored part of the claim, and therefore, has not set forth a *prima facie* case of anticipation. While

pulse-shaping filters may be adjusted during the manufacturing process, there is nothing in the cited art or in the knowledge of one skilled in the art that teaches or suggests adjusting the pulse-shaping filter during the manufacturing process <u>based on an estimated impulse response</u> of the pulse-shaping filter, as claimed in claim 16. Therefore, claim 16 is patentably distinct from the cited art.
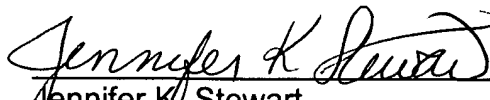
Claim 17 claims "using the estimated impulse response to refine the demodulating." As discussed above, Bottomley does not estimate the impulse response of a pulse-shaping filter. Because Bottomley does not estimate the impulse response of a pulse-shaping filter, Bottomley does not have an estimated impulse response at his disposal to use in the refinement of a demodulation process. As such, Bottomley cannot anticipate claim 17.

Because of the arguments set forth above, Applicants believe that pending claims 1-32 stand in condition for allowance. As such, claim allowance is solicited at the Examiner's earliest convenience. If any issues remain unresolved, Applicants request that the Examiner call the undersigned so that any such issues may be expeditiously resolved.

Respectfully submitted,

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